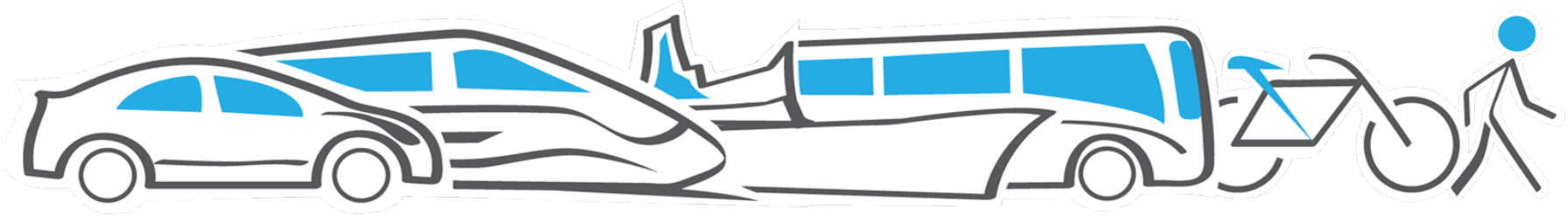
Training Workshop for Developing successful Public-Private Partnerships (PPPs)

ROAD ASSET MANAGEMENT SYSTEM

World Bank

12th October 2021

Mesfin Jijo, Dr Theuns Henning



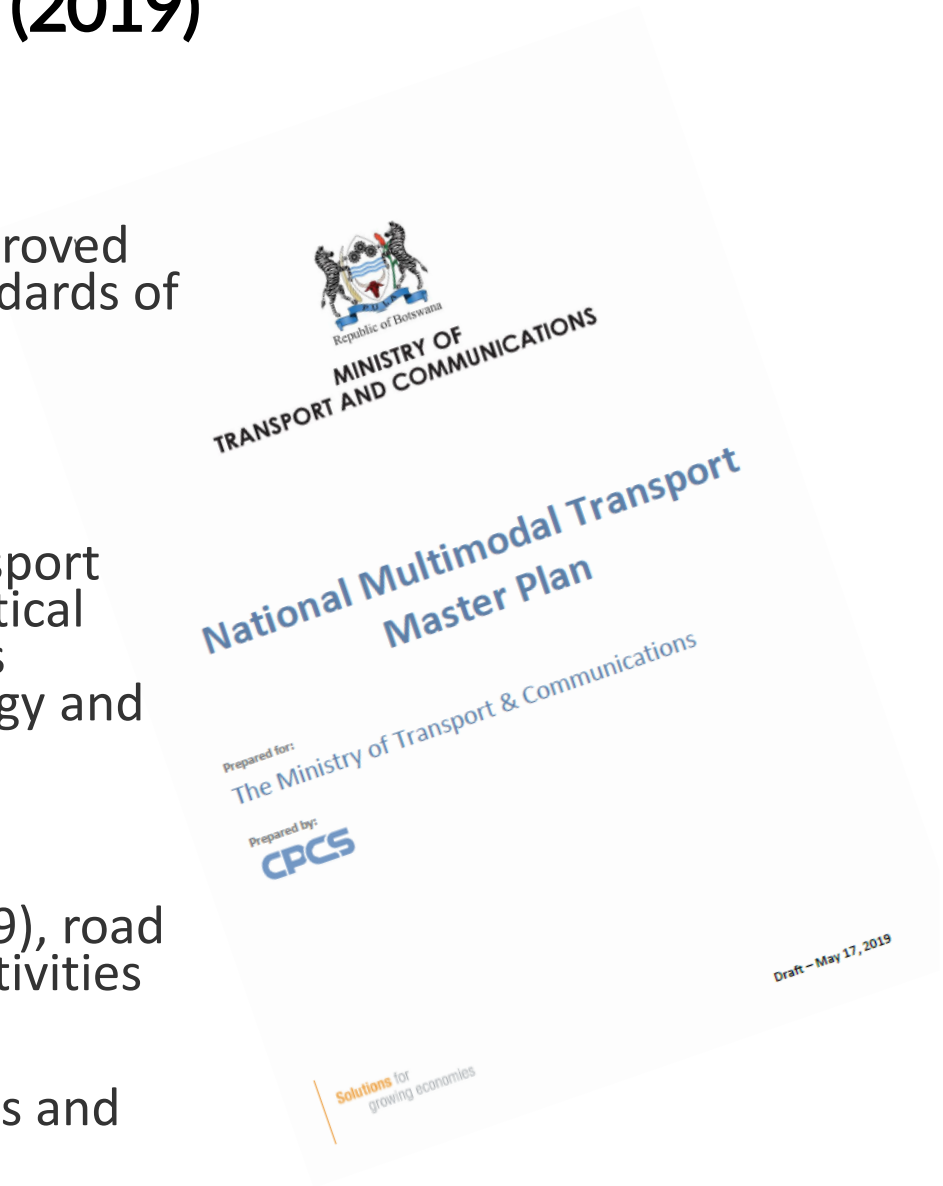
National Multimodal Master Plan (2019)

Goal 1: Increase Sustainability

This means that the transport system is improved and maintained at acceptable levels or standards of service, including infrastructure, services, operations, safety, and environment

GOAL 3: Improve System Condition

This means that passenger and freight transport systems are continually maintained, and critical infrastructure and vehicles are improved, as needed, including the adoption of technology and related innovations.

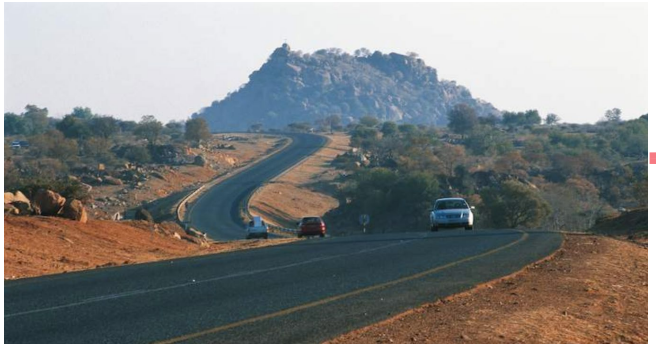


According to the Ministry of Transport (2019), road asset management aligned as one of the activities for the four key development themes.

- A sound decision-making tool is both needs and issues for the country.

Why do most Countries Strive to Improve on Road Asset Management?

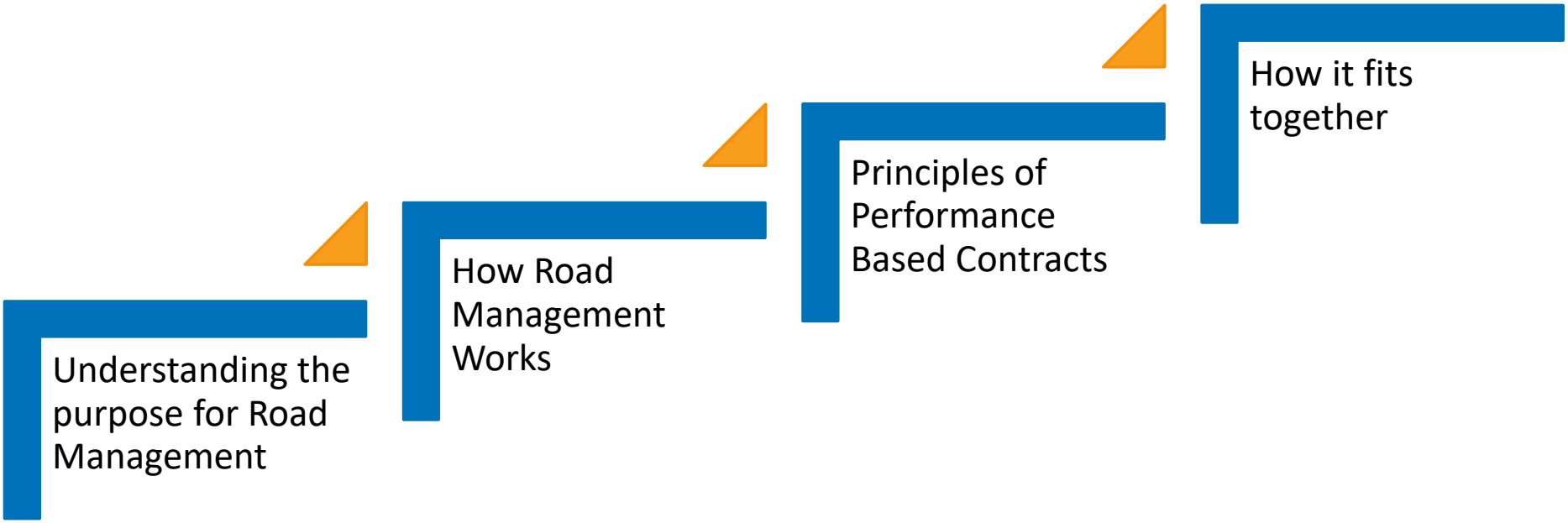
- Being able to motivate road investment needs
- Show the impact of different budget scenarios
- Being able to report on maintenance and condition



- Ensure all roads are being managed to common approach
- Achieving lowest life-cycle costs

Photo: Ian Michler

Coverage


Understanding the purpose for Road Management
How Road Management Works
Principles of Performance Based Contracts
How it fits together

Guiding Principles of A Road Asset Management System

Preservation First

The highest priority is to preserve the functionality and safety of the existing highway system.

System not Projects

To meet the needs of the entire system, Botswana-RAMS requires a system wide, program-driven approach, instead of individual project solutions.

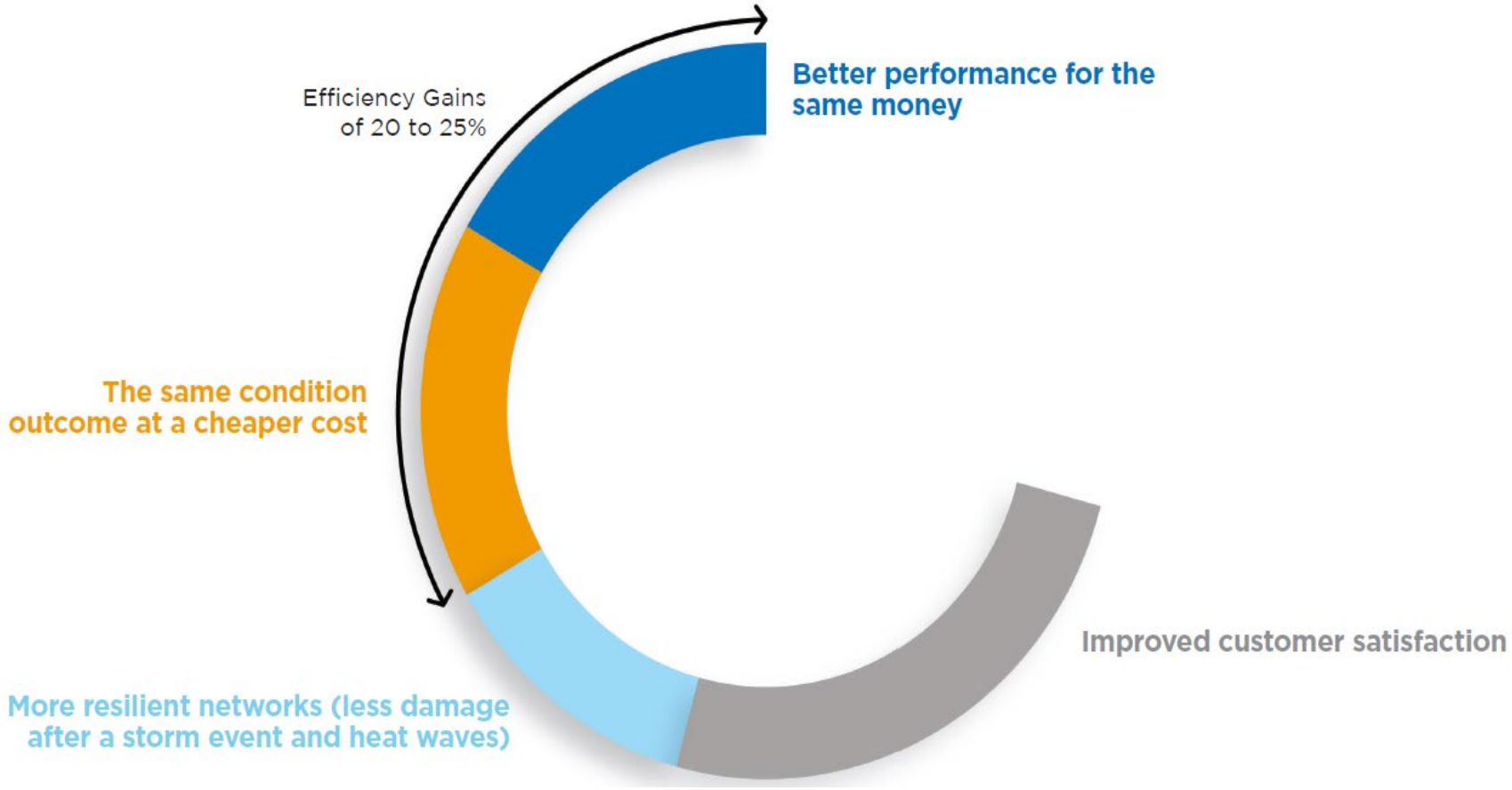
Maximize Return on Investments

Achieving minimum whole of life cost on the road network

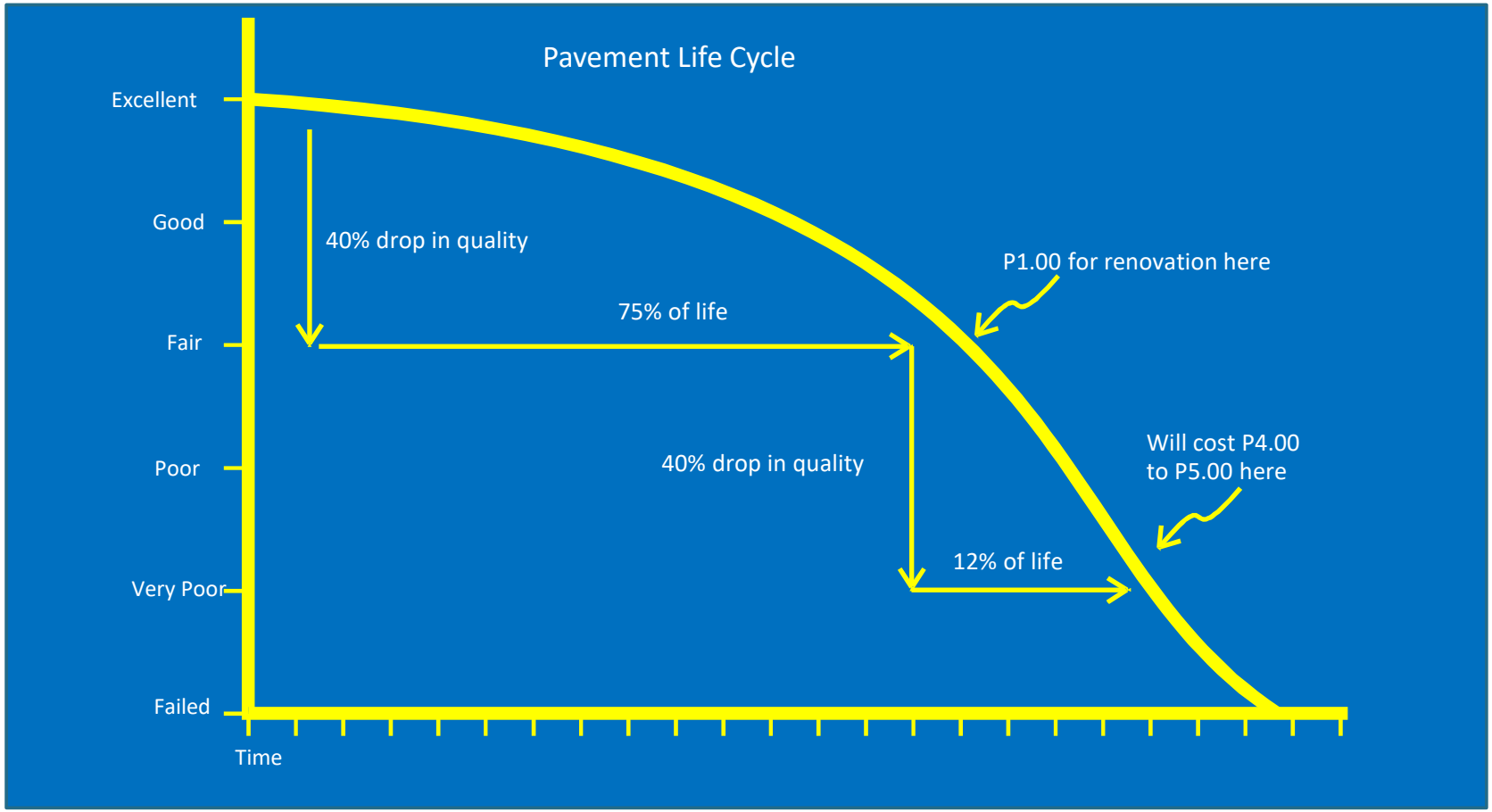
Make It Sustainable

A sustainable system will be fully managed by the Ministry of Transport into the future

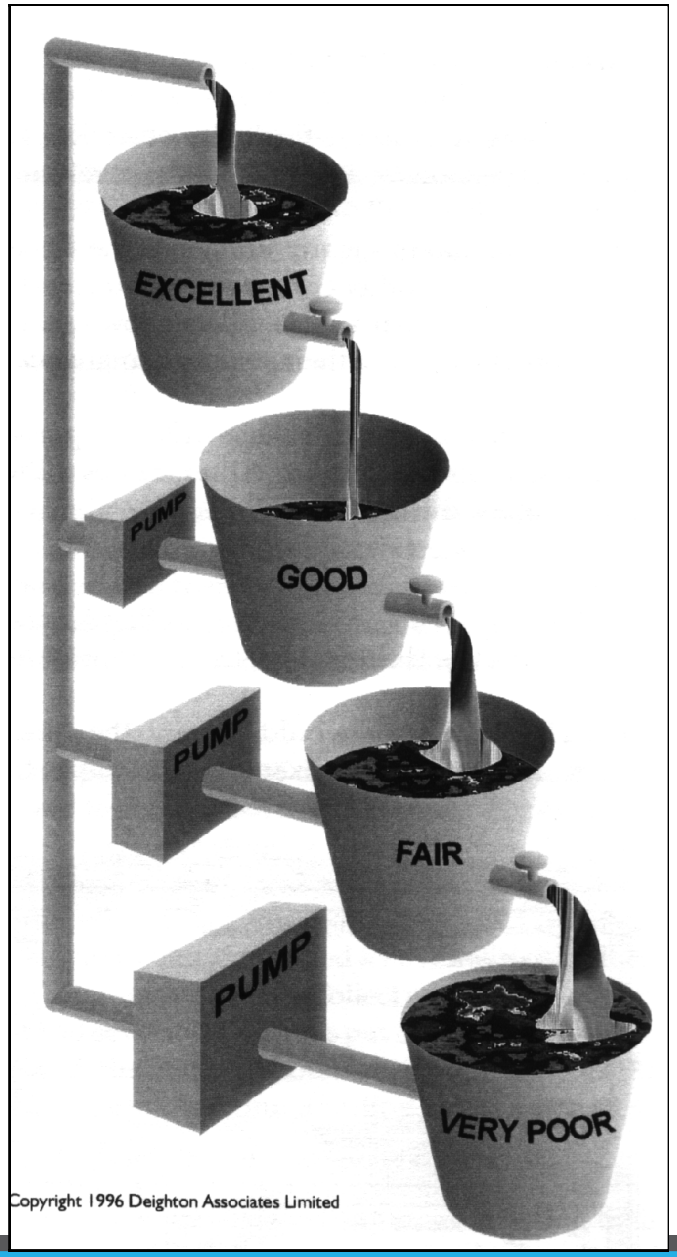
The Benefits from Road Management Process



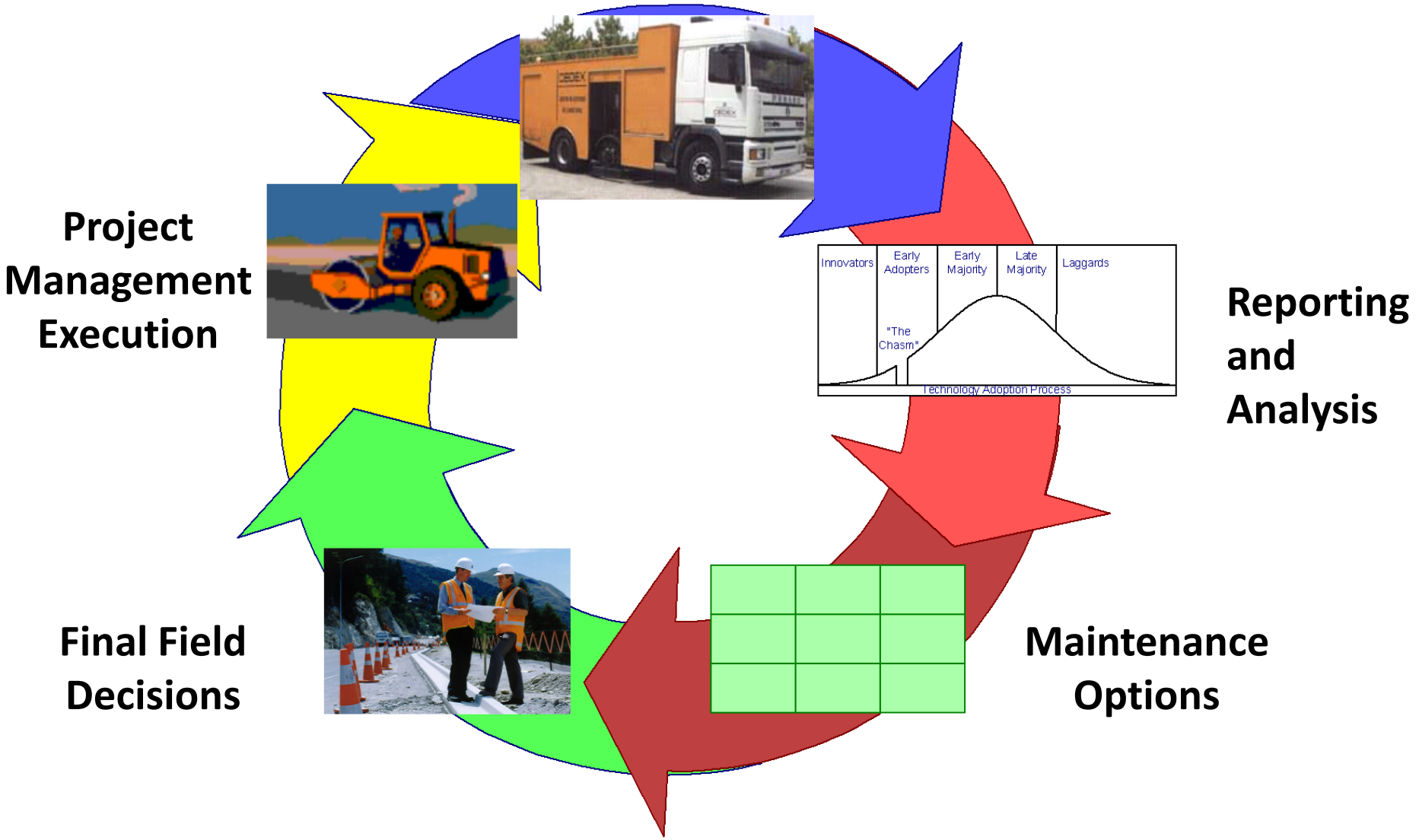
Life Cycle Cost Analysis



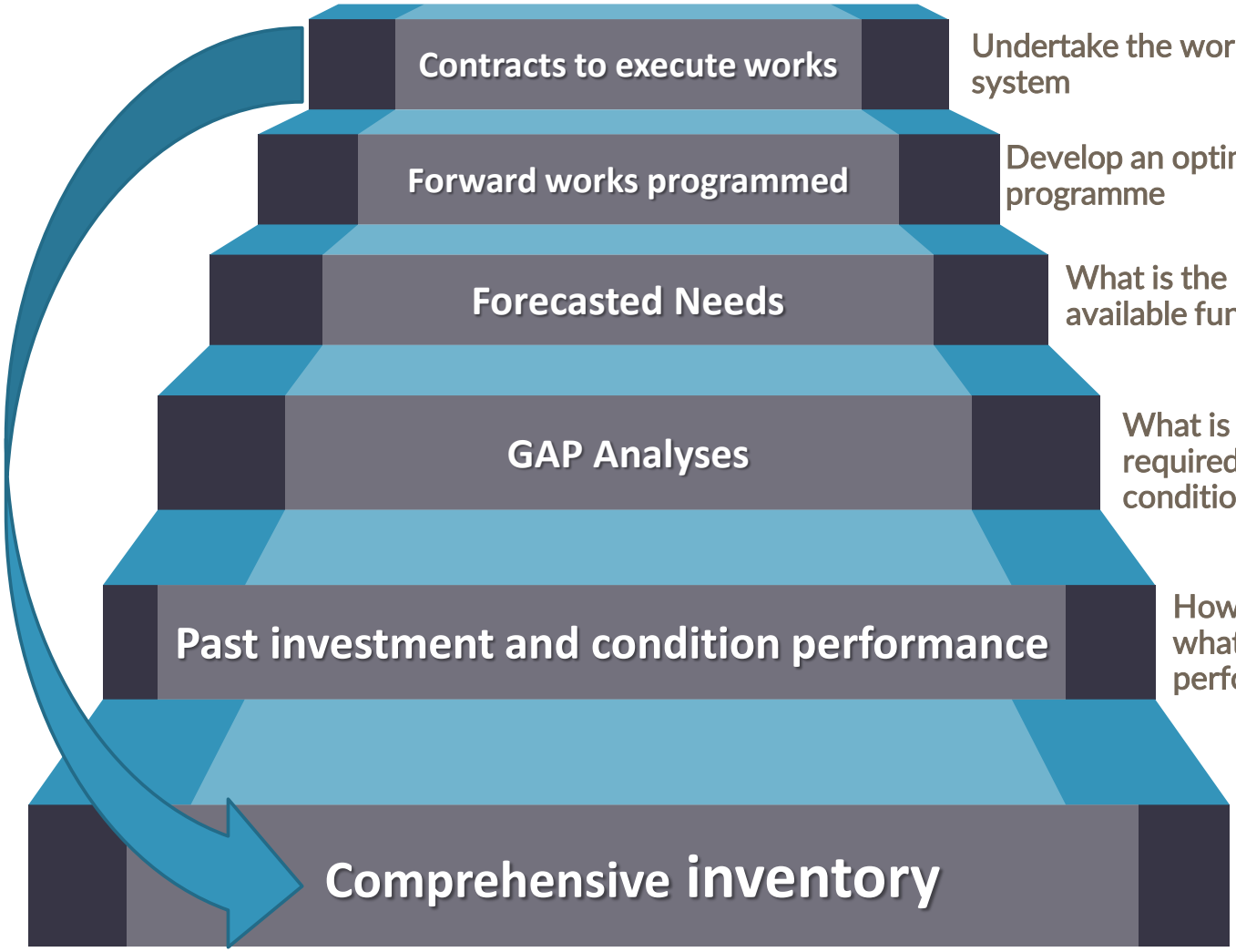
Optimisation Model



Road Management Planning Cycle



The Process of Road Management Systems



Undertake the work, provide data that feeds back into the system

Develop an optimised road maintenance and improving programme

What is the long-term investment needs in the context of available funding?

What is the current road condition in relation to the required performance levels. E.g. should the network condition be improved or not?

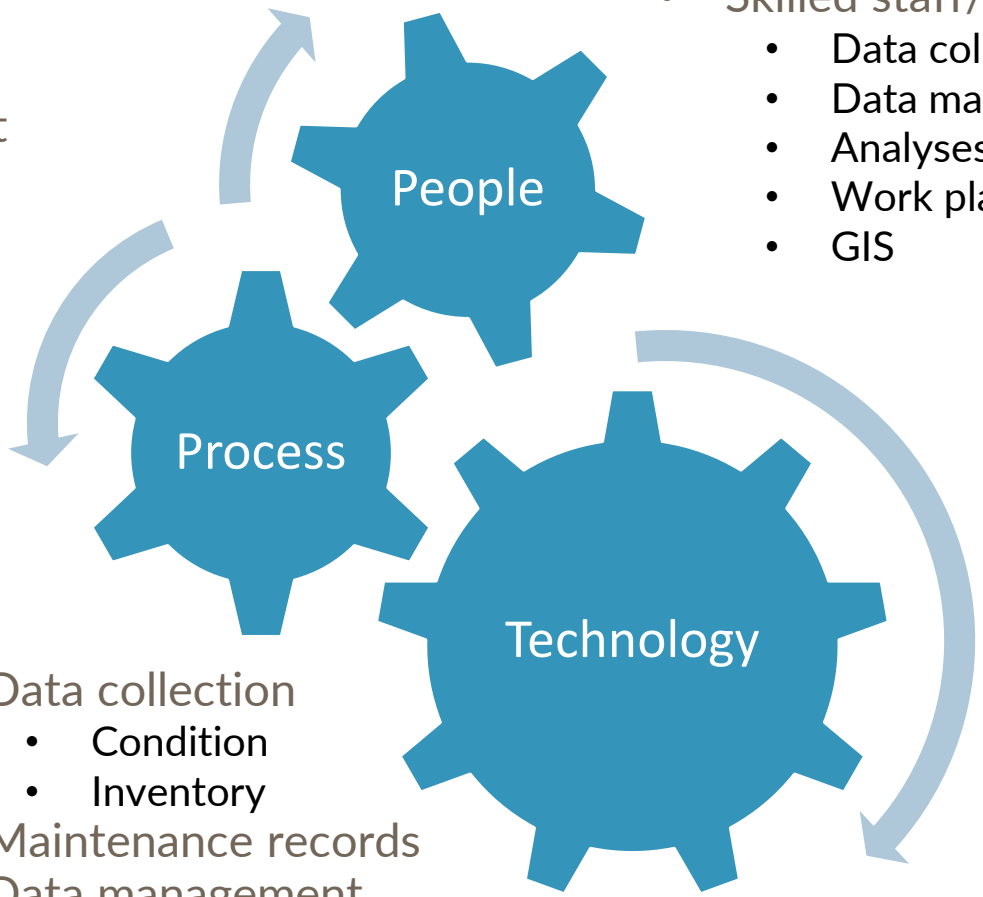
How much did we spend on the network and what was the consequential condition performance?

Knowing the accurate extend of the network – full set of quantities on road pavement, surface, structures and furniture

Components of a Road Asset Management System

Botswana Ministry of Transport have been Using a Road Management System

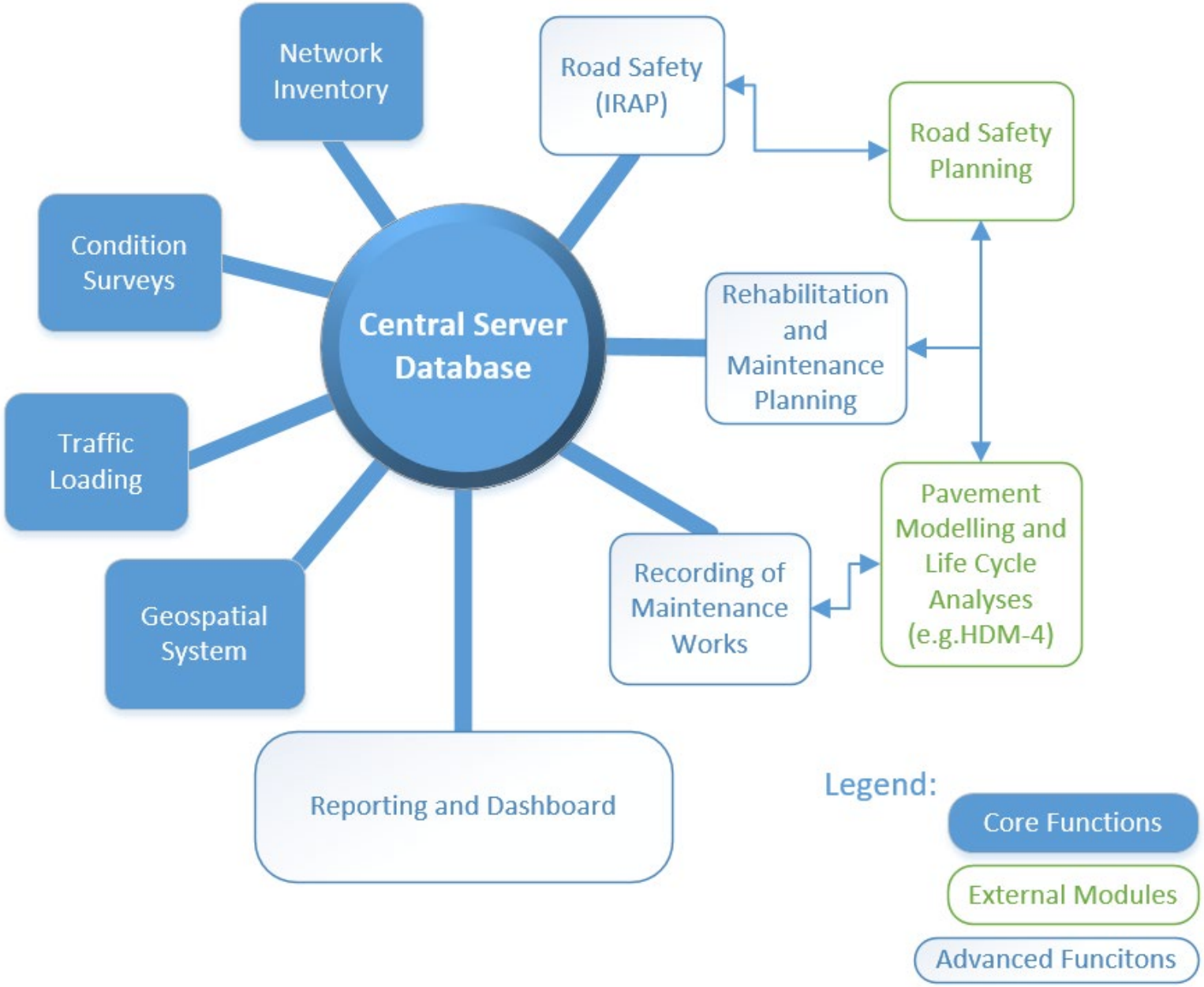
- Integration of systems
- Integration of different business processes
- Connecting financial planning with works execution and procurement options



- Executive support
- Skilled staff/consultants for:
  - Data collection
  - Data management
  - Analyses
  - Work planning
  - GIS

- Data collection
  - Condition
  - Inventory
- Maintenance records
- Data management
- Analytics capabilities
- System Integration

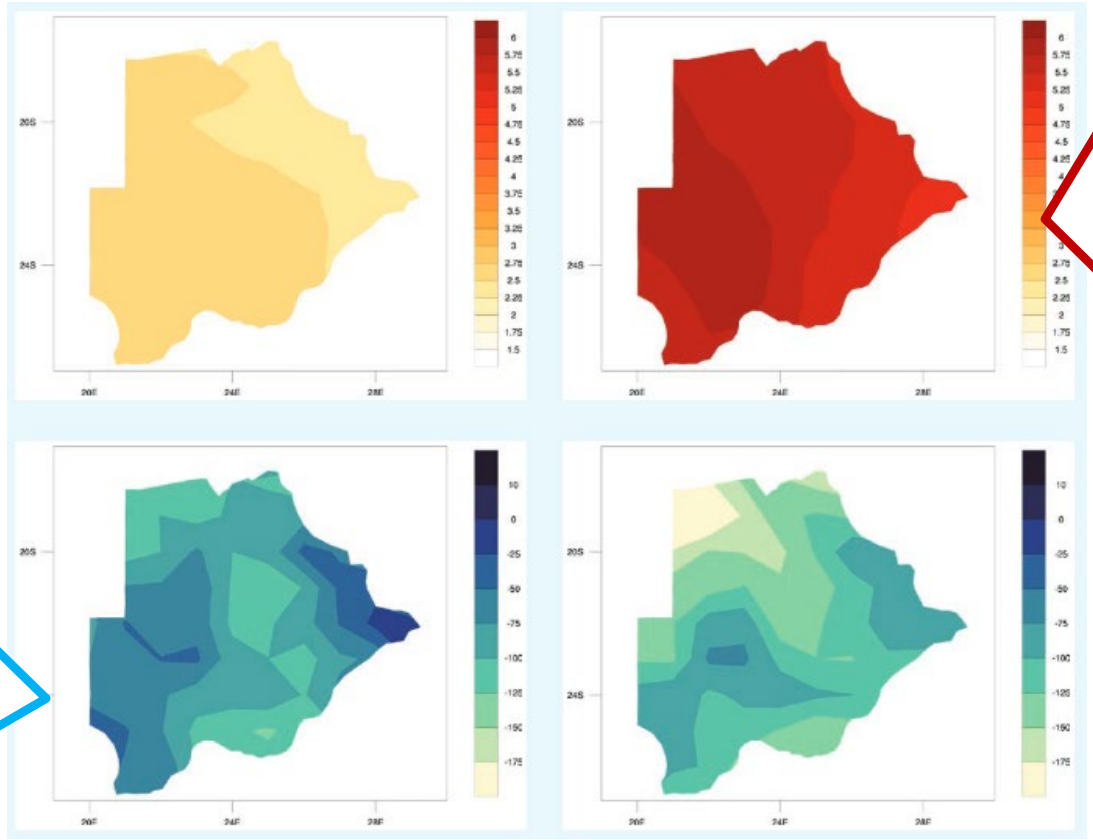
Data collection, Integration and Analysis



Climate Considerations need to become part of Asset Management

- Botswana climate future **key trends***

projected change (32 GCMs) in annual temperature (top) and precipitation (bottom) by 2040–2059 (left) and by 2080–2099 (right), relative to 1986–2005 baseline under RCP8.5



mean monthly temperature changes expected to increase by 2.5°C for the 2050s and by 5.0°C by end of the century, under a high-emission scenario

Average overall rainfall will decrease across the country

Source: World Bank (2021)

Climate Considerations need to become part of Asset Management

BOTSWANA CLIMATE CHANGE RESPONSE POLICY

With support from

- Botswana Climate Change Policy: "*Integration of climate change considerations into infrastructure planning, designing and development processes*" *(Source UNDP)*

Asset management refers to systematic approach to the governance and realization of value from the things that a group or entity is responsible for, over their whole life cycles ISO 55 000

Considerations for Botswana to Integrate Climate into Asset Management

- Robust Asset Management (AM) in itself, already significant enhances the resilience of infrastructure
- Slight adjustments to AM process, significantly contribute to adapting for climate change
- Main issue for Botswana is perhaps understanding the secondary effects of **heat** and **droughts**.
  - Direct impact of heat on roads surfaces
  - Secondary impact due to land-use changes and changes to traffic movement
- Development Priorities:
  - Collection of relevant data
  - Vulnerability assessments need consider multi-hazards and downscaled to an appropriate level
  - Enhance understanding of Return-on-investment for resilience improvements

The Origin of Performance Based Contracts

- The attempt of any contract is the qualify + quantify the intent of the contracting parties in a document
- In maintenance type contracts, it is difficult to translate the desired outcome through a set of quantity-based pay-items

- **PBC, however, allows the asset owner to specify exactly what the desired outcome needs to be – e.g. Roughness levels**
- **PBC also allows the owner to pay only for what they want to get out of the contract – (efficiency gains)**

Popularity of PBC

Road agencies have moved towards a PBC approach because it offers several advantages over more traditional approaches:

a) cost savings or improved conditions in managing and maintaining road assets

b) greater expenditure certainty for road agencies; ability to manage the road network less planning onus on the agency

c) better customer satisfaction with road service and conditions

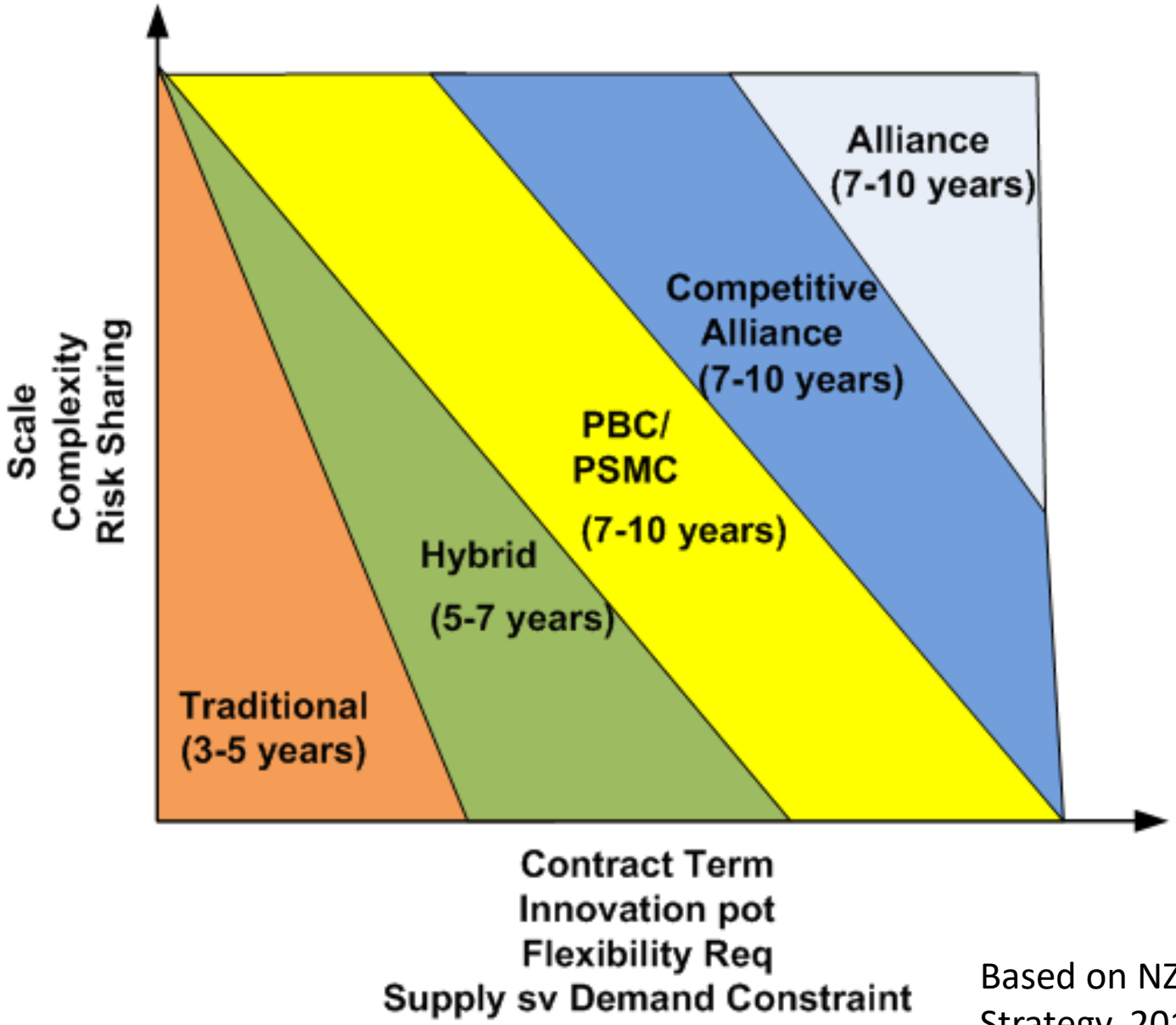
d) stable multi-year financing of maintenance

e) more appropriate risk-sharing

Contract Forms for Network Maintenance Management

	Traditional	Hybrid	PBC	Alliance/PPP
Length of Contract	3 years	3-7 years	5-10 years	10 years plus
Contract Type	Unit price and lump sum (Scheduled rates)	lump sum and Unit price Scheduled rates)	Lump sum	Lump sum
Activities Included	All as prescribed	All except rehabilitation	All	All plus some capital
Prescribed Criteria	Output based	Outputs & some Outcome	Outcome Based	Outcome based
Risk	Client	Client some contractor	Contractor	Partnership
Contractor Flexibility	No	Some	Yes	Yes

Choosing the Appropriate Procurement Model



Based on NZTA, Procurement Strategy, 2011

Truly Understand the Objectives for a Network before Embarking on a PBC

- Knowing what you want to achieve assist in developing:
  - Contract term and structure
  - Contract governance
  - PBC terms of payment
  - Method of specifying road condition performance
  - Risk sharing
  - Data collection during contract
  - Termination clauses
  - Penalty clauses
  - Underpinned quantities
  - Dispute processes
- Ultimately, the PBC contract lay the foundation of the relationship and behaviour of individual parties

Risks Sharing Provides Opportunities but can be Costly

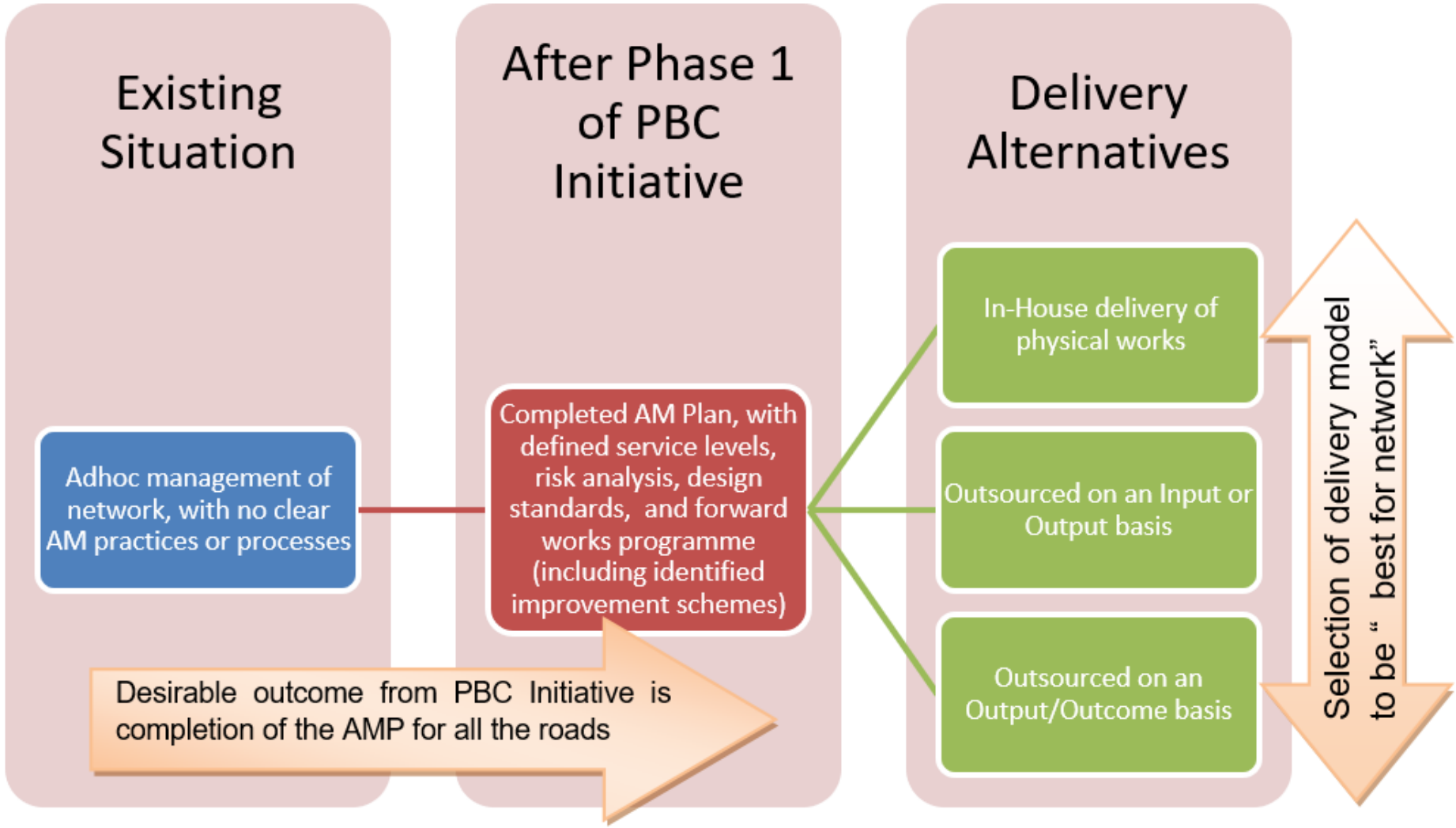
- **Background Risk**
  - Political, legal and regulatory
  - Force majeure – floods, earthquake
  - Traffic growth, load limits

- **Cost Risk**
  - Associated with the cost of undertaking the work

- **Quantum / Performance risk**
  - How much work is required to maintain the specified level of service or
  - Certainty around actually achieving the desired performance standards

Source: INDII

Asset Management Helps Choosing the Right Procurement



Structures Approach for Adopting PBC

A Review current asset management practices

- Review adequacy of current information collection, collation and use
- Collect additional data
- Video network
- Review current practices

B Develop asset management strategy

- Define level of service (Los) for respective road classes
- Cost estimate for assuring LoS
- Asset management strategy

C Implement Procurement Strategy

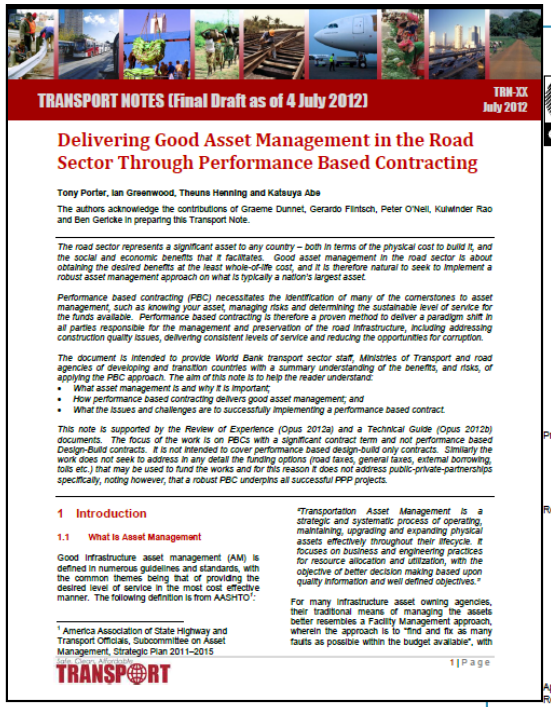
- Procurement strategy and implementation plan
- Procurement documentation
- Tendering etc.

Summary

- Road Asset Management Systems (RAMS) is essential for successful contracts PBC/PPP
- The benefits of adopting RAMS promises better services to community at the lowest lifecycle costs
- Through he RAMS process, sufficient information is provided on the performance and investment needs on the network
- Botswana needs to start incorporating climate considerations into the asset management panning process

Guidance Documents

- World Bank review of PBCs including a guide for delivering good AM through PBCs
- Freely available from World Bank website



TRANSPORT NOTES (Final Draft as of 4 July 2012) TRN-XX July 2012

Delivering Good Asset Management in the Road Sector Through Performance Based Contracting

Tony Porter, Ian Greenwood, Theuns Henning and Katsuya Abe

The authors acknowledge the contributions of Graeme Dunnet, Gerardo Flintsch, Peter O'Neil, Kulwinder Rao and Ben Gericke in preparing this Transport Note.

The road sector represents a significant asset to any country – both in terms of the physical cost to build it, and the social and economic benefits that it facilitates. Good asset management in the road sector is about obtaining the desired benefits at the least whole-of-life cost, and it is therefore natural to seek to implement a robust asset management approach on what is typically a nation's largest asset.

Performance based contracting (PBC) necessitates the identification of many of the cornerstones to asset management, such as knowing your asset, managing risks and determining the sustainable level of service for the funds available. Performance based contracting is therefore a proven method to deliver a paradigm shift in all parties responsible for the management and preservation of the road infrastructure, including addressing construction quality issues, delivering consistent levels of service and reducing the opportunities for corruption.

The document is intended to provide World Bank transport sector staff, Ministries of Transport and road agencies of developing and transition countries with a summary understanding of the benefits, and risks, of applying the PBC approach. The aim of this note is to help the reader understand:

- *What asset management is and why it is important;*
- *How performance based contracting delivers good asset management; and*
- *What the issues and challenges are to successfully implementing a performance based contract.*

This note is supported by the Review of Experience (Opus 2012a) and a Technical Guide (Opus 2012b) documents. The focus of the work is on PBCs with a significant contract term and not performance based Design-Build contracts. It is not intended to cover performance based design-build only contracts. Similarly the work does not seek to address in any detail the funding options (road taxes, general taxes, external borrowing, tolls etc.) that may be used to fund the works and for this reason it does not address public-private-partnerships specifically, noting however, that a robust PBC underpins all successful PPP projects.

1 Introduction

1.1 What is Asset Management

Good infrastructure asset management (AM) is defined in numerous guidelines and standards, with the common themes being that of providing the desired level of service in the most cost effective manner. The following definition is from AASHTO[1]:

"Transportation Asset Management is a strategic and systematic process of operating, maintaining, upgrading and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well defined objectives."

For many infrastructure asset owning agencies, their traditional means of managing the assets better resembles a Facility Management approach, wherein the approach is to "find and fix as many faults as possible within the budget available", with

[1] America Association of State Highway and Transport Officials, Subcommittee on Asset Management, Strategic Plan 2011–2015

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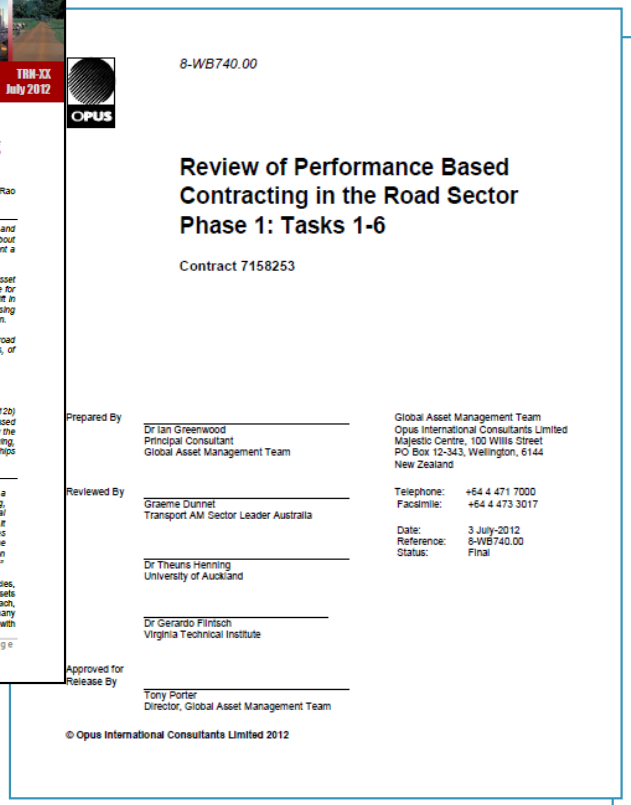

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Review of Performance Based Contracting in the Road Sector Phase 1: Tasks 1-6

Contract 7158253

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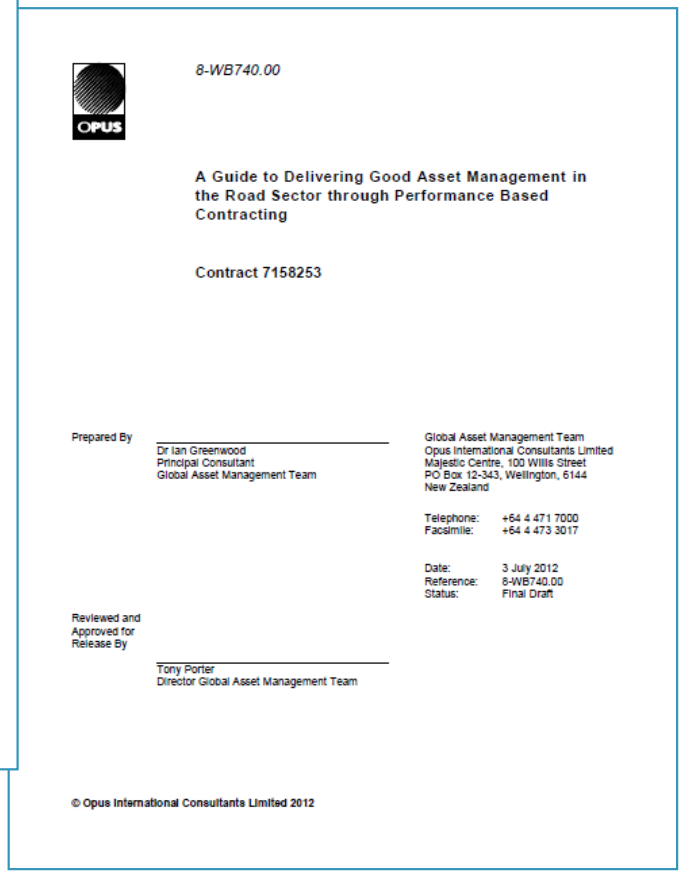

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A Guide to Delivering Good Asset Management in the Road Sector through Performance Based Contracting

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Thank you ……